

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
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## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) <span style="float: right; font-size: 1.2em;">15 JUN 2005</span>		
<b>FOR FURTHER ACTION</b> See paragraph 2 below		
Applicant's or agent's file reference  5048-6-PCT		
International application No.  PCT/US05/06982	International filing date (day/month/year)  02 March 2005 (02.03.2005)	Priority date (day/month/year)  02 March 2004 (02.03.2004)
International Patent Classification (IPC) or both national classification and IPC  IPC(7): H01M 8/00 and US Cl.: 429/12		
Applicant  KRUESI, PAUL R.		

1. This opinion contains indications relating to the following items:

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input checked="" type="checkbox"/> | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application   |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application  |

#### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Michael Barr Telephone No. (571) 272-1414
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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US05/06982

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_. which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
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International application No.

PCT/US05/06982

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
- ☐ paid additional fees
- ☐ paid additional fees under protest
- ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
- ☒ not complied with for the following reasons:
- See the lack of unity section of the International Search Report(Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☐ all parts.
- ☒ the parts relating to claims Nos. 1-9

**WRITTEN OPINION OF THE  
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International application No.  
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**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims 9	YES
	Claims 1-8	NO
Inventive step (IS)	Claims NONE	YES
	Claims 9	NO
Industrial applicability (IA)	Claims 1-9	YES
	Claims 1-9	NO

**2. Citations and explanations:**

Claims 1-3, 7 and 8 lack novelty under PCT Article 33(2) as being anticipated by Pasavento U.S. Patent No. 6,200,697 hereinafter Pasavento.

Pasavento teaches a carbon air fuel cell comprising an anode, cathode, a membrane there between, an electrolyte that can be sodium hydroxide and a carbon fuel that can be activated carbon or recovered from organic waste (abstract, column 1, line 13 - column 4, line 28, and column 5, lines 1-67)

Claims 1, 2, 4 and 5 lack novelty under PCT Article 33(2) as being anticipated by Tao U.S. Patent No. 6,692,861 hereinafter Tao.

Tao teaches a carbon oxygen fuel cell comprising an anode made of graphite, cathode made of stainless steel, a membrane located there between, an electrolyte and a carbon fuel that can be activated carbon (column 1, line 30 - column 7, line 20).

Claims 1 and 6 lack novelty under PCT Article 33(2) as being anticipated by Juda et al. U.S. Patent No 3,470,026 hereinafter Juda et al.

Juda et al. teaches a fuel cell comprising an anode, a cathode, a membrane that is proton permeable that is located there between, an electrolyte and a carbon fuel (abstract and column 1, line 55 - column 2, line 72).

Claim 9 lacks an inventive step under PCT Article 33(3) as being obvious over Pasavento in view of Taylor U.S. Patent No. 3,085,053 hereinafter Taylor.

Pasavento teaches everything in the above lack of novelty statements.

Pasavento does not teach the use of a regenerative cell.

Taylor teaches that fuel cells are well known for creating energy from carbon fuels and that a reversed fuel cell may be employed to regenerate said carbon fuel and in turn create oxygen as a desirable byproduct.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the teachings of Taylor into the Pasavento reference in order to provide a fuel cell system that can regenerate the carbon fuel to recycle the byproducts and make a system that is self-sufficient.

Claims 1-9 meet the criteria set out in PCT Article 33(4), and thus meet industrial applicability because the subject matter claimed can be made or used in industry.

**CHAPTER I**  
**PCT TELEPHONE MEMORANDUM**  
**FOR**  
**LACK OF UNITY OF INVENTION**

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PCT No.: PCT/US05/06982

Examiner: Robert Hodge

Attorney spoken to: Robert Trevor

Date of call: 20 May 2005

- ☐ Amount of payment approved:
- ☐ Deposit account number to be charged:
- ☐ Attorney elected to pay for ALL additional inventions
- ☐ Attorney elected to pay only for the additional inventions covered by
- ☐ Group(s):
- encompassing --
- ☐ Claim(s):
- ☒ Attorney elected NOT to pay for any additional inventions, therefore, only the first claimed invention (Group I) covered by Claim(s) 1-9 has been searched.
- ☒ Attorney was orally advised that there is no right to protest for any group not paid for.
- ☒ Attorney was orally advised that any protest must be filed no later than 15 days from the mailing of the Search Report (PCT/ISA/210).

**Time Limit For Filing A Protest**

Applicant is hereby given 15 days from the mailing date of this Search Report in which to file a protest of the holding of lack of unity of invention. In accordance with PCT Rule 40.2, applicant may protest the holding of lack of unity only with respect to the group(s) paid for.

**Detailed Reasons For Holding Lack of Unity of Invention:**

Please See Continuation Sheet

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*Note: A copy of this form must be attached to the Search Report.*

## ATTACHMENT TO CHAPTER I PCT TELEPHONE MEMORANDUM FOR LACK OF UNITY OF INVENTION

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### **Continuation of Detailed Reasons For Holding Lack of Unity of Invention:**

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-9, drawn to a fuel cell.

Group II, claim(s) 10-14, drawn to a regenerative cell.

Group III, claim(s) 15-17, drawn to a method of producing hydrogen.

Group IV, claim(s) 18-20, drawn to a method of forming carbon dioxide.

Group V, claim(s) 21-25, drawn to a second method of forming carbon dioxide.

Group VI, claim(s) 26-28, drawn to a second method of forming hydrogen.

The inventions listed as Groups I-VI do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The common technical features of all of the claimed inventions are well known in the art, i.e. an anode, a cathode, a membrane, and an electrolyte.

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*Note: A copy of this form must be attached to the Search Report.*